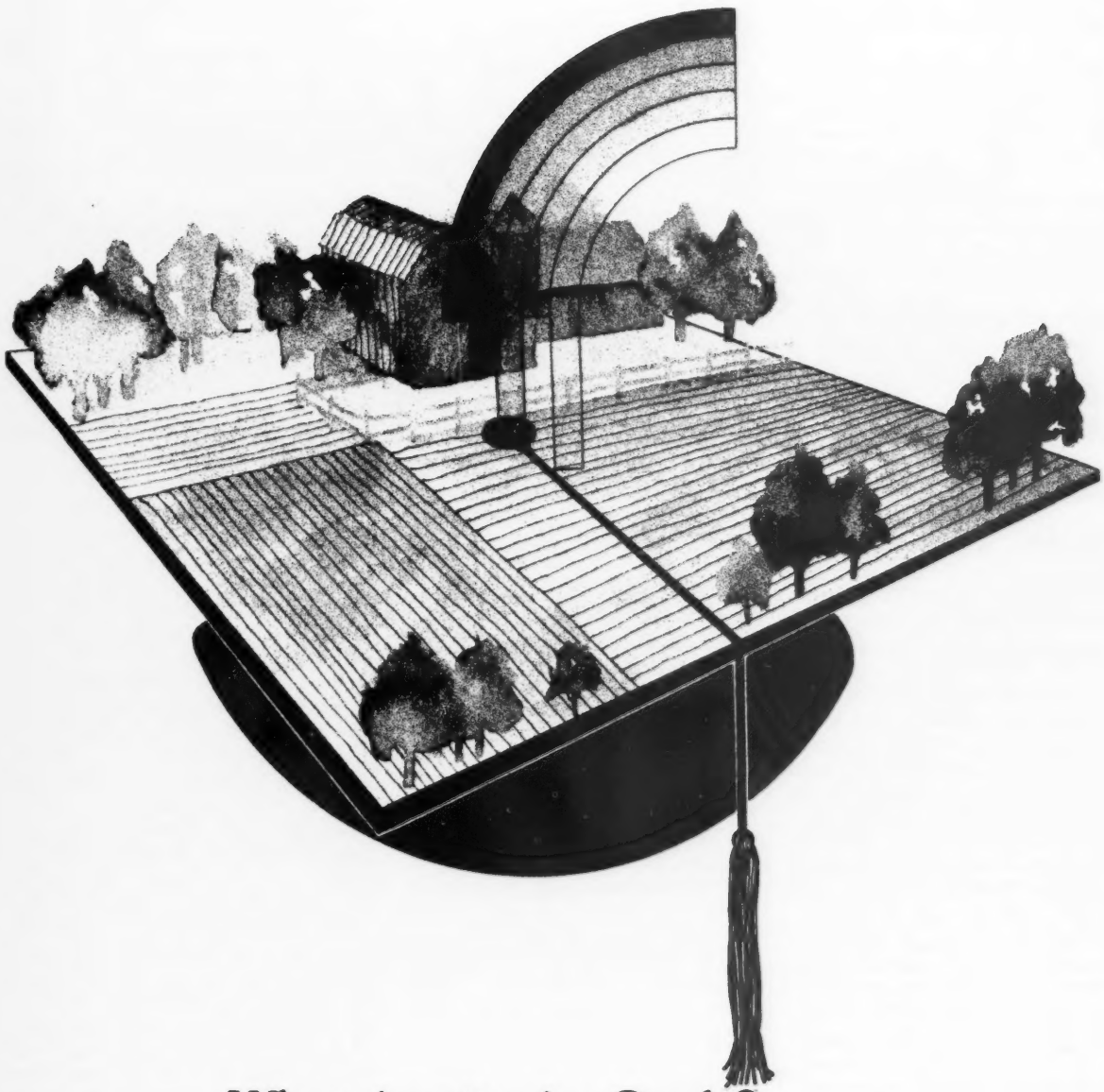
THE FARM INDEX

U.S. Department of Agriculture July 1976



What Awaits Ag Grads?

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The Farm Index is published monthly by the Economic Research Service, U.S. Department of Agriculture. July 1976. Vol. XV. No. 7.
Readers are invited to write for the research materials on which we base our articles. Address queries to The Farm Index, Rm. 1664, Economic Research Service, U.S. Department of Agriculture, Wash., D.C. 20250. Please cite article titles when ordering.

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Outlook

Wheat dominates the crop scene this time of year, and here's how things look:

- Production will likely be surpassed only by 1975's bumper outturn. Fewer acres being harvested this year plus lower yields account for the difference.
- Supplies appear to be more than adequate to take care of domestic and export needs for the 1976/77 season, which begins June 1 this year instead of July 1 as in the past. Prospective U.S. wheat sales to the U.S.S.R. are included in the export estimates.

Details:

Bad weather in the Nation's midsection continued to adversely affect the winter wheat crop in May. Based on June 1 conditions, production for 1976 was forecast at 1.4 billion bushels, down 3 percent from the previous forecast and 14 percent from last year's record.

Yield per harvested acre is expected to average 30.0 bushels, down 2 bushels from the 1975 average. Acreage to be harvested is 8 percent behind last year.

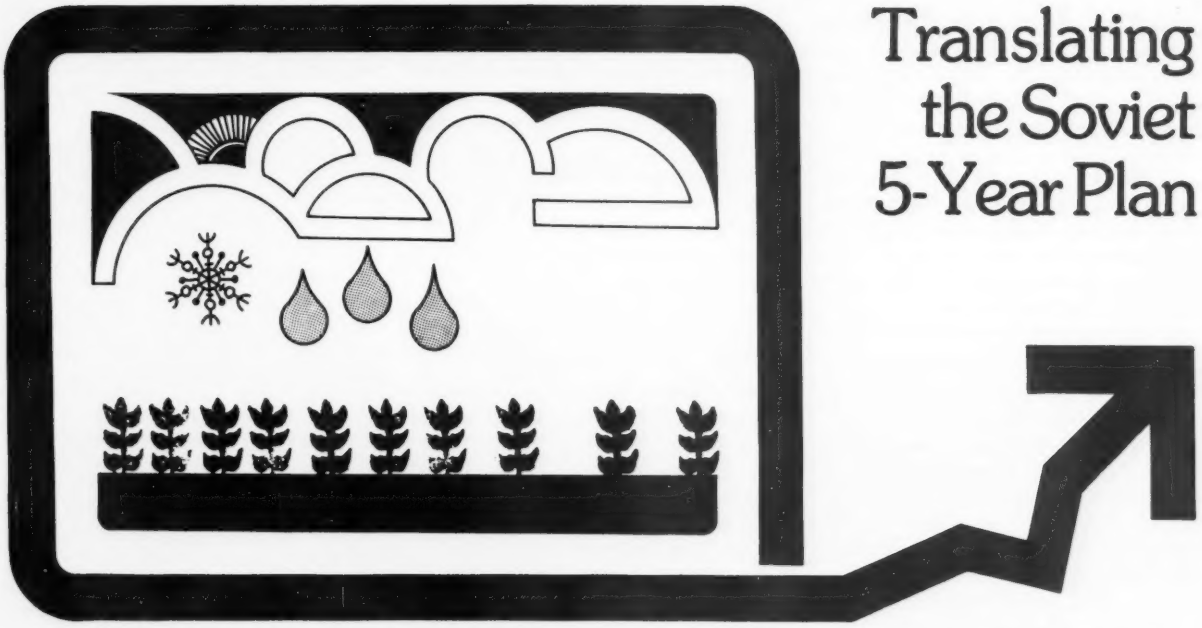
The estimated winter wheat crop, together with the projected spring wheat harvest (based on April planting intentions) add to a total between 1.9 and 2.1 billion bushels. This compares with the record 1975 crop of 2.1 billion bushels and the 1.8 billion harvested in 1974.

With recovery in livestock feeding expected to continue, domestic use of wheat in 1976/77 will likely expand. However, recent strength in wheat prices may limit the resurgence in wheat feeding.

The world wheat crop looks good, and production could exceed 1975's total of 344 million tons. If this happens, the world's import demand in 1976/77 would proabably fall off a bit from last season's 1.2 billion bushels.

Wheat markets continue to recover. Recent news about dryness in the U.S. spring wheat belt and the reduction of crop prospects in Europe and the Soviet Union, along with strong soybean and feed grain markets, have boosted domestic wheat prices. Though prices are likely to weaken in the coming months—in view of the size of this year's crop and the prospects for adding more stocks—it now seems unlikely that farm prices will hit last year's harvesttime lows of around $3 a bushel.

Translating the Soviet 5-Year Plan



After suffering a disastrous grain crop failure in last year's drought, Soviet agriculture is gearing up for a new 5-year plan that calls for production increases.

While the new plan is less ambitious than previous ones, ERS analysts contend that a sustained effort and favorable weather will be needed to attain the new goals.

Americans, of course, have a keen interest in Soviet agriculture, following last year's heavy grain purchases by the Soviets. The success or failure of the new plan could have a significant impact on U.S. agricultural exports to the U.S.S.R.

New Soviet production targets for 1976-80 include increases of 14-17 percent in gross agricultural output, 18-21 percent in grains, 7-11 percent in meat, and 7-10 percent in milk.

More capital investment. To attain these and other targets, the Soviets plan a 31-percent increase in capital investments in agriculture, compared with 60 percent during the 1971-75 period.

Agricultural employment is expected to drop about 10 percent, but other inputs will grow strongly. Deliveries of fertilizer will jump by three-fifths, nearly as much as in 1971-75.

Soviet data and information about specifics of the plan are difficult to obtain, but based on available information, here is ERS's assessment of the Soviet guidelines that were discussed at the February-March 1976 Party Congress:

- Planned growth of livestock product output is weak; average 1976-80 meat and milk targets are only slightly above original 1971-75 targets.
- With an even incidence of good and bad weather years, an average grain production target of 215 to 220 million tons appears realistic.
- Feed production possibilities appear to be consistent with livestock production goals, based on projections of past trends. Data are sketchy, however, in this area.
- Livestock production plans seem inconsistent with planned growth of incomes. Wages are expected to grow 16 to 18 percent, much more than the 2- to 6-percent growth for per capita meat production. Rising incomes normally signal a rising demand for livestock products.
- In light of the above, Soviet leadership may decrease demand for livestock products—perhaps by raising prices—or increase supply by such means as increasing imports of livestock products.
- In normal-weather years, the available grain may cover domestic needs, except for stockpiling. So imports would be needed primarily to offset crop shortfalls, or, with normal weather, to build stocks, or to offset exports.

Common inconsistencies. Inconsistencies in the feed-livestock area have been common in other Soviet 5-year plans.

During 1971-75, planners apparently intended to meet growth in livestock product demand through increasing production, but feed output could not be expanded enough to cover growing needs. It appears that the new plan may reverse that inconsistency. Feed production goals and potentials appear more in line with livestock production targets, but livestock product supply may not be adequate to cover demand unless other policy changes are made.

Livestock products. The trend of increasing demand for livestock products being tied to increasing incomes is reflected in the 1971-75 period. Last year, average money wages—excluding collective farmer incomes—were about 20 percent higher than in 1970. Per capita meat consumption increased about as

sharply; per capita milk consumption made slight gains; and egg consumption jumped a third. The meat and egg consumption increases actually outpaced projections of demand based on prior trends.

The failure of dairy product consumption to increase as much as the historical demand analysis suggested may have been due to supply constraints. Retail prices for the major products remained constant during 1971-75 at levels established in 1962.

Sketchy information. Details are not available about planned increases in livestock product consumption. But the pressures on consumption may be indicated by the 16- to 18-percent wage increase against a 2- to 6-percent increase in meat, 2- to 5-percent milk increase, and 8- to 12-percent egg increase.

Soviets may not be spending the extra wages elsewhere in the economy. The 5-year plan calls for an increase of 30-32 percent in consumer goods, versus 37 percent attained and 49 percent planned for 1970-75. Retail price increases may be possible, although the plan states that policies will be continued to ensure stable retail prices on major food and nonfood goods.

Increased supply? If the Soviets reject price increases to dampen demand, then the alternative may be to increase supply. Although it is possible that Soviet planners intend for domestic livestock production to exceed the guidelines, it may be more likely that a supply increase would come from imports of livestock products.

Soviets have already been purchasing substantial quantities of livestock products. Imports of meat and meat products in 1974 soared to 515,000 tons—up from the more normal level of 129,000 tons in 1973—and remained high in 1975. Another indicator of Soviet willingness to import livestock products was the imports of 230,000 tons of butter in 1973.

In both instances, however, the Soviets seemingly took advantage of an abundant supply that coincided conveniently with a Soviet need. In 1974, butter imports fell to minimal levels.

Meat market activity. While Soviet intentions for livestock product imports are not known, there are some indications that the U.S.S.R. will become more active in the world meat market:

- Large meat imports are likely this year because of the 1975 drought and its effect in reducing feed supplies.
- In 1974, the Soviets signed a long-term agreement with Argentina for beef imports. The pact specified an increasing scale of purchases reaching 50,000 to 100,000 tons by 1977.

More grain planned. Grain production goals for the 5 years have been announced although other feed targets are still foggy. Grain output is scheduled to average 215 to 220 million tons during the new plan—a 35- to 40-million ton jump over the prior 5-year average. This is a sharp increase, but it would return output to about the long-term trend since the 1975 results were so poor that they pulled the 1971-75 average well below the trend line. A normal-weather, trend-line crop in 1975 would have increased the 1971-75 average to the planned level of 195 million tons.

With increased outputs or improved technology, the 20 to 25 million tons of added output during 1976-80 is a reasonable goal that is consistent with previous performance.

More fertilizer. The planned expansion of fertilizer use, alone, could facilitate much of the planned boost in grain output. Fertilizer deliveries are to be increased from 73 million tons in 1975 to 115 million tons in 1980. Usage of grain is planned to increase from 27 million tons to 44-46 million tons.

All and all, the projected grain output expansions are consistent with the modest livestock product increases set in the plan.

But Soviet plans are still contingent on an uncontrollable factor: weather. Variability in weather conditions is likely to cause sharp fluctuations in feed supplies from domestic production.

Low grain reserves. Grain reserves are believed to be at low levels after the 1975 shortfall. Although plan guidelines indicate stockbuilding during the 1976-80 period, this may depend on the sequence of weather conditions in each year of the plan, as well as on trade decisions and the pace of livestock production development.

All of this adds up to substantial trade implications. Principle commodity groups that could affect trade are grains, oilseeds, and livestock products—especially meat.

The past 5 years have brought an average annual Soviet grain import level of 15 million tons. In the preceding 5-year period, grain imports averaged only 2 million tons. Exports dropped from 7 million tons to 4 million tons in the same period. The bulk of the imports—an 8-million-ton average—in the last 5 years has come from the U.S.

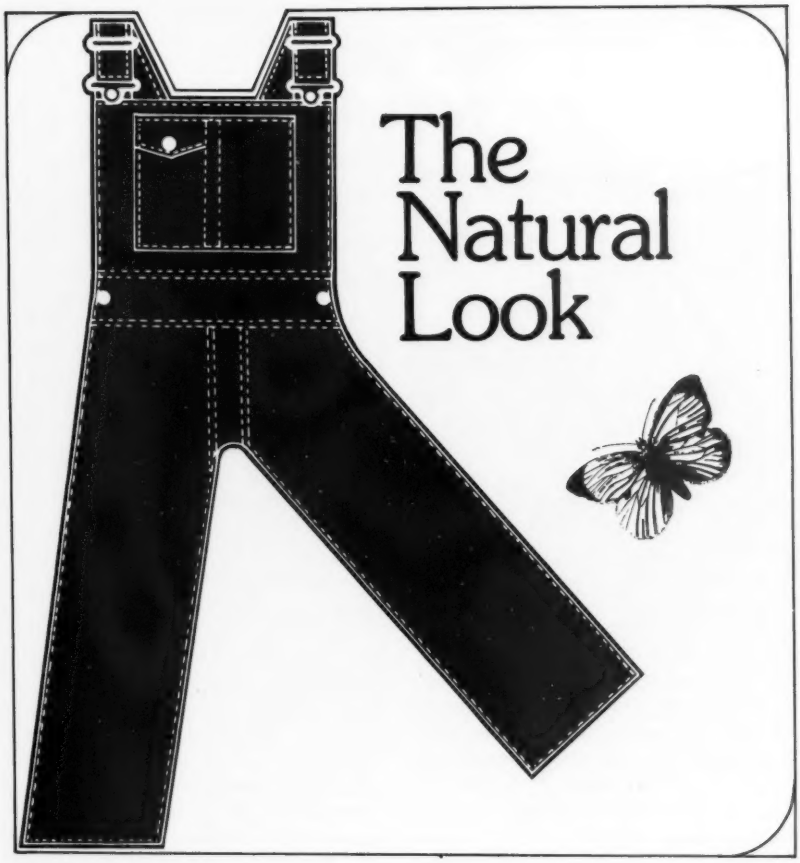
Grain imports vary. Yet, Soviet imports of grain are extremely variable, ranging from a low of 5 million tons in 1974-75 to 22 million tons in 1972-73, with a new high of 25 million tons estimated for 1975-76. Future Soviet grain trade policy is not known. But, it appears likely that Soviet grain trade will depend on:

- Present and long-term commitments to import grain, such as the agreements to buy 6 to 8 million tons annually from the U.S.
- Effects of year-to-year weather variability on grain output.
- Grain stockpiling policies.
- Pace of livestock herd rebuilding, and the degree to which goals may be exceeded.

Oilseed and oilseed meal imports may increase in the next 5 years if the Soviets emphasize increased efficiency in livestock feeding. Little chance exists of major boosts in domestic oilseed production.

Record meat imports? Meat imports should jump sharply this year as domestic production slumps. The 1976 imports may be well above the previous high of 515,000 tons in 1974. It is difficult to determine import strength after that.

[Based on the paper, "Agricultural Trade Implications of the 1976-80 Soviet Economic Plan," by David M. Schoonover, Foreign Development and Competition Division, presented at the annual meeting of the Washington Chapter of the American Association for Advancement of Slavic Studies, Washington, D.C., April 30, 1976.]



With summer in midswing, many of us are decked out in all-cotton or cotton-blend clothes. And we may well have more cotton clothing hanging in our closets and tucked away in our chest-of-drawers than last year, thanks to an upturn in the Nation's economy and our yearning for "the natural look."

And the quest for the natural look is not limited to cotton. Mill orders for wool apparel fabrics are already running exceptionally strong for this fall and winter.

A flip through fashion magazines or a trip to a clothing store will turn up a good share of cotton or cotton-blend shirts, blouses, dresses, skirts, and pants, and of course, that strong favorite, denim—in everything from jeans to evening attire. Fall and winter fashion previews also confirm that wool and cotton corduroy will be "in" for the cold-weather season.

More clothing dollars. Economic recovery—easing inflation and falling unemployment—has meant more money in consumers' pockets for such things as household goods and wearing apparel. And confidence in parting with some of those greenbacks is perking up.

The increased consumer demand for natural fibers comes on the heels of a slump for textiles in general—including manmade fibers. Fiber consumption dropped more than a half billion pounds last year to about 10½ billion pounds.

But 1976 should be a brighter year for the textile industry. Just how bright it will be for the natural fibers will depend on several things: fiber supplies, price competition from manmade fibers, levels of textile imports, and fashion trends.

Cotton plantings up. Productionwise, cotton looks good. Farmers this year have planted over 1½ million acres more than in 1975. And barring a repeat of 1974's and 1975's adverse weather and insect problems, yields should return to more normal levels.

Although a slightly higher Federal loan rate and a moderately higher target price were incentives to plant more cotton, farmers were mainly spurred on by the fact that farm cotton prices looked especially favorable compared with those of alternative crops. For example, spring cotton prices were up over 50 percent from 1975, while prices of soybeans (a major competitor for cotton land) were down nearly a fifth, and grain sorghum prices were about the same.

Foreign trade booming. Foreign demand for U.S. cotton, after a 2-year slump because of piled-up stocks abroad and noncompetitive U.S. prices, has rebounded sharply. South Korea has become the biggest taker of our cotton shipments, with Japan dropping to third place. Taiwan now ranks second.

On the other side of the foreign trade coin are U.S. imports of cotton textiles, which are posing a threat to the domestic industry. Based on recent uptrends, these imports could reach an equivalent of over a fifth of U.S. mill use. Moreover, most of the increase in cloth shipments is coming from the People's Republic of China, with which we have no textile trade agreements—thus, no means of limiting imports.

Another possible threat to the cotton industry is competition from manmade fibers. Although cotton seems to be holding its own so far in the match—it claims about 30 percent of the total fiber market—price could prove to be a major trouble spot, as cotton prices are running moderately above those for manmade fibers.

Wool situation mixed. The wool situation is a mixed bag. Although wool's share of total fibers processed in domestic woolen and worsted mills was up 4 percent in 1975 to a total of 22 percent, the gain could be short lived. Reasons: Wool prices are above those for manmade fibers, and domestic

raw wool production is steadily declining.

Production, in fact, has been on the decline since World War II. This year's shorn wool output is projected around 8 percent less than last year, which was already down 10 percent from 1974. Declining sheep numbers are to blame for the reduced wool clip.

The woolen and worsted mills, however, have apparently not been fazed by the decline in domestic wool production—if mill activity is any indication. Last year, the mills processed 25 percent more wool into fabrics than during 1974, and business so far this year has been brisk.

Carpet market rebounds. In addition to apparel wool, mills may turn out slightly more wool carpet fibers this year. After 2 years of sluggish sales caused by the depressed housing industry, 1976 total carpet fiber consumption should be up 10-15 percent. However, manmade fibers will probably get the biggest chunk of the buoyed market, so that wool's share may actually drop.

Imports, of course, have been making up for the slack in domestic wool supplies. And in view of shrinking production on the homefront, imports are expected to pick up even more in the years ahead.

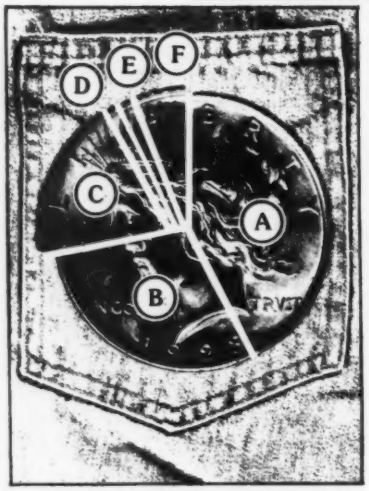
Currently, about two-thirds of our duty-free imports come from New Zealand, and about 70 percent of the dutiable shipments from Australia.

Exports rose sharply in 1975 due to U.S. prices being considerably lower than foreign prices. However, with the domestic supply crunch and resulting higher prices here at home, exports in early 1976 were only about one-third of year-earlier levels.

Mohair in foreign demand. Another natural fiber of commerical importance in the U.S. is mohair (goat hair). Although the demand here is lackluster, foreign customers—particularly Europe, Japan, and Poland—are eager takers. In fact, almost 93 percent of the 1975 domestic clip went overseas. As a result of the increasingly strong demand, prices have zoomed from year-earlier levels and are well above support prices.

[Based on *Cotton and Wool Situation*, March 1976, Commodity Economics Division.]

The Denim Dollar



A	Retailer Wholesaler	42¢
B	Apparel Manufacturer	30¢
C	Textile Mill	20¢
D	Cotton Ginners	>1¢
E	Marketing Firm	<1¢
F	Farmer	6½¢

Americans have fallen in love with denim. Whether for its durability, style, or youthful image, it's become as symbolic of our Nation as baseball, hot dogs, or apple pie.

Denim has cropped up in everything from clothes to book covers, but nowhere is it more evident than in the increasingly popular blue jeans. In 1974, 613,400 bales of cotton went into blue jeans alone, up almost 35 percent from 1970. In fact, about 20 percent of all cotton used in clothing now goes into jeans.

Needless to say, denim—blue jeans in particular—has been a boon to the cotton industry and, in turn, to many other parts of the economy as well. For the consumer's denim dollar doesn't stop at the retail store with the sale of the jeans, but varying proportions are received at each stage all the way down to the farmer.

Indeed, the retailer and the wholesaler do get the biggest piece of the denim dollar—42 cents—including such costs as transportaiton to the retail outlet, store displays, inventory management, and sales personnel salaries.

The apparel manufacturer also gets a pretty big chunk—30 cents. His services involve styling denim patterns, cutting the ready-prepared fabric, and sewing it into the final product.

The textile mill receives a little less than 20 cents of the denim dollar. For its share, the mill spins the raw cotton into yarn, dyes the yarn, and then weaves it into denim fabric.

Separating the textile mill and the farmer are two groups who also share in the consumer's dollar—ginners and marketing firms.

Cotton ginners take slightly over 1 cent for drying, ginning, bagging, and tying the cotton. And the marketing firm receives almost another cent for moving the raw cotton from the production area to the textile mill. Such marketing functions include transportation, warehouse storage, weighing and sampling, compressing, and outhandling.

The farmer himself receives a bit less than 6½ cents of the consumer's denim dollar. However, this doesn't take into account any income he may get from selling cottonseed, or the money he gets for the cotton which is later lost during the manufacturing process.

[Based on "Who gets the Cotton Denim Dollar," by Edward H. Glade, Jr., Commodity Economics Division, published in the *Cotton and Wool Situation*, March 1976.]

A Younger Breed of Farmers

New wrinkles on the face of American agriculture? On the contrary, there are fewer wrinkles. According to surveys by the Bureau of the Census, our farmers are actually younger nowadays.

This could mark the end of a trend going on since before World War I, when statistics first began to show that old age was creeping up on people self-employed in agriculture.

In 1910 the age of all farm operators averaged out to 43.5 years but by 1965 that figure had climbed to 51.3 years. In the same span, the proportion of farmers under 35 dropped from 29 percent to about 11 percent.

Where would it all end? Who would take over when farmers died or retired? The answers had to wait till the early seventies and the census surveys which showed the long decline in numbers of young farmers has come to a halt.

The data indicate that the median age of persons self-employed in agriculture reached a peak of 53.1 years in 1970. This statistic is not exactly comparable to what was gathered for earlier years, since it included a small percentage of people who were not farm operators, such as those engaged in veterinary work, crop dusting, and cotton ginning. Also, it relates only to persons whose sole or principal occupation was in agriculture.

In any case, the conclusion is the same: Average age of self-employed persons in agriculture has been inching lower since 1970. By 1975, it had dipped to 50.4 years, or nearly 3 years less than in 1970.

More significantly, workers under 35 years rose from 265,000 to 358,000—a gain of 35 percent—whereas those 60 and over fell from 601,000 to 461,000, a decrease of 23 percent.

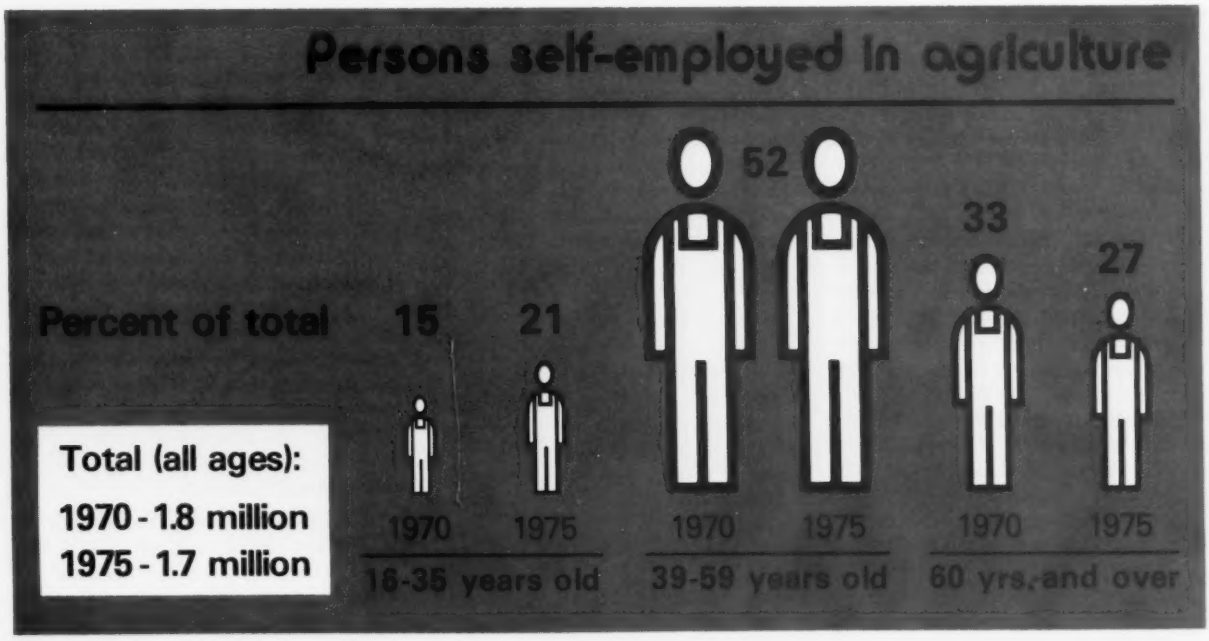
Says an ERS demographer: "One can only conjecture about the circumstances that have finally halted the rise in the age of farmers. But it was known that the aging process could not go on forever. It was simply going through a transition. The day had to come when the number of workers reached some stabilization and when the age composition began to normalize."

Though specific details are lacking, the reasons for the age dropoff may be tied to better profits from farming, the improved attitude of farm youth toward agriculture and rural life, and an entry of urban-reared young adults into farming. Too, the trend may have been buttressed by the large number of young adults in the population—"baby boom" children have grown up.

"Whatever the details to be filled in," the ERS demographer continues, "the existence of the new trend is definite.

"If there were two demographic articles of faith for those engaged in rural policy or research in the 1960's, they were the advancing average age of farmers and the high rate of rural to urban migration. Both of these trends changed in the 1970's."

[Based on special material by Calvin L. Beale, Economic Development Division.]



The Versatile (and sometimes pesty) Palm Family

Coconut oil has always been the granddaddy of U.S. imported oils, with palm oil coming in a distant second in recent years. For example, from 1970 to 1975, we purchased and produced from imported copra an average 858 million pounds of coconut oil each year, compared to 317 million pounds of imported palm oil. In the last 2 years, however, palm oil has been bridging the gap, and imports of the two oils this season are about the same. ERS takes a look at the two leading imported oils: coconut oil—which competes with no domestic oil in many of its specialty uses, and palm oil—a direct competitor of the U.S. soybean.

Palm Oil

Chances are, some of that shortening you're buying in the supermarket is made from imported palm oil. Americans consumed 870 million pounds of it last year, up from only 124 million pounds in 1970. Most of it goes into shortening.

Even with the increase in consumption, palm oil use is still minor compared to other edible fats and oils. It accounted for about 8 percent of all food oils that Americans ate last year, compared with 58 percent for soybeans, 10 percent for tallow and lard, and 12 percent for butter on a fat content basis.

This comes as small comfort to U.S. producers of fats and oils. Ten years ago palm oil was practically a nonentity. Domestic producers now worry that it will continue to make inroads in their markets, and many in the industry are pushing for import restrictions (all our palm oil comes from abroad).

Imports to increase. As ERS sizes up the situation, palm oil imports will remain strong between now and 1980, barring restrictive action. The good news, however, is that the import levels probably will not be the likes of the 1975/76 crop year.

How did palm oil manage to get a foothold in the U.S. market?

First, we impose few barriers to imports of vegetable oils.

Furthermore, world production has been zooming in recent years, particularly in Malaysia, which produces nearly half the world's total. Palm oil plantings, moreover, have been encouraged in developing countries. Further production gains seem certain. Based on existing planted acreage, USDA estimates that Malaysia's production of palm oil will almost double by 1980, increasing the world's production to 4.7 million metric tons from 2.9 million in 1975.

Major advantage. Palm oil's major competitive advantage over U.S. oilseeds is its high yield and resulting low cost per pound. Oil palms produce a whopping 3,475 pounds of oil per acre, compared to only 290 pounds for U.S. soybeans. Unlike soybeans, oil palms produce a relatively small amount of low-quality meal. Even so, the cash value for the two food oils, based on 1971-75 average prices, is $665 per acre for oil palms and $162 for soybeans.

Malaysia currently has an export tax on palm oil of about 3.7 cents per pound, which could vary depending on the price level. With the tax included, the break-even price for palm oil exported to the U.S. is 12 cents per pound if palm kernel oil is 16 cents per pound. At present prices of about 16 cents, it is profitable to Malaysia to export palm oil to the U.S.

Distinct drawback. Palm oil's biggest disadvantage is that it is a saturated oil. There has been some concern in recent years over saturated fats raising the cholesterol level in diets and possibly endangering more people to heart attacks.

However, nearly all imported palm oil goes into the production of vegetable shortening. All of the oil used in manufacturing shortening, and much of the oil used in making margarine, is hardened by a hydrogenation process which adds hydrogen to the unsaturated fatty acids, making them into more saturated fatty acids. Therefore, palm oil's saturation shouldn't be a barrier to its use in this market. As for the production of liquid cooking oil and salad oil dressing, palm oil's high saturation may be a distinct drawback.

Palm oil imports have increased substantially since 1970, from 64,000 metric tons to 436,000 in 1975.

Good news for consumers. The 1975/76 situation looks good for consumers. Domestic soybean oil production is increasing 1.5 billion pounds. In addition, the U.S. will boost imports of palm oil by 250 million pounds. During the first 3 months of 1976, there was little price spread between the two food oils. Both were down sharply from prior highs.

Farmers are expected to respond to lower soybean prices and less favorable price relationships by shifting plantings from soybeans to corn and cotton in 1976/77. Once this happens, the price differential between soybeans and corn should improve, and soybean production will be increased.

Soybean oil prices to remain stable. World demand and supply conditions are projected to keep soybean oil prices in the 12-14 cents per pound range between 1976/77 and 1979/80.

Meanwhile the U.S. is projected to import significant amounts of palm oil, but less than the 1974/75 and 1975/76 levels. The basic reason for this expected decline is a recovery in the domestic production of animal fats, cottonseed, and soybean oil, with domestically produced fats and oils being price competitive.

[Based on the report, "Analysis of the U.S. Fats and Oils Industry to 1980, with Implications for Palm Oil Imports," by Wayne Boutwell, Harry Doty, Duane Hacklander, and Alan Walter, Commodity Economics Division.]

Coconut Oil

In their native lands there are almost as many uses for coconut palms as there are trees themselves.

Need to build a house? The coconut palm provides not only the building material but many of the furnishings as well—chairs, beds, mattresses, eating utensils, lamps.

You can cook coconut dishes on stoves fueled by coconut oil and drink a variety of coconut beverages out of coconut cups. Toys, lampshades, buttons, buckles, teapots, soap, toothpaste, rope, and twine are just a few of the items derived from the coconut tree.

The versatile palm is the fisherman's best friend. It gives him materials to build his boats, sails, ropes, fishing lines, and nets.

The nonseasonal coconut. Although most trees bear fruit only once a year, the coconut palm is useful all year long. For example, the unopened flowers are protected by a natural "cloth," which looks like burlap. From this covering shoes, caps, and other things are fashioned.

A clump of unopened flowers can be bruised and made to "weep" up to a gallon of sweet, cloudy, brown liquid a day. This can be boiled down to a syrup, then crystallized into a dark sugar similar to maple. Left alone, the liquid ferments into an alcoholic "beer."

American uses. In this country, coconut oil is used in many specialty products, such as confectionaries, baked goods, and popcorn—items that require lauric acid oils in their manufacture. Coconut oil, high in lauric acid and other short-chained fatty acids, fits the bill perfectly. Since the U.S. doesn't grow any oil-bearing crops containing lauric acid, the demand for coconut oil doesn't change much from year to year. The only other major competitor in these specialty products is palm kernel oil—another imported oil.

Like palm oil, coconut oil is high in saturated fats, causing some concern about raising the cholesterol level in diets and possibly endangering more people to heart attacks. Eighty percent of coconut oil's fatty acids are saturated, compared to 45 percent for palm oil and 14 percent for soybean oil.

Minor amounts used in shortening. However, of the oils consumed in shortening, coconut oil accounts for only 3 percent, not nearly as much as the 20 percent for palm oil or the 54 percent for soybean oil.

Like palm oil, coconut oil's high saturation shouldn't be a barrier to its use in shortening because the hydrogenation process used in making shortening converts the unsaturated fatty acids into a more saturated type. At the present time, relatively small amounts of both coconut and palm oils are used in margarine and cooking and salad oils.

A relatively new food use for coconut oil has been in filled milk products, or fluid milk substitutes. These products are milk from which the butterfat has been removed and replaced by vegetable oil—usually coconut oil. The result is a milk product which keeps better, costs less, and tastes almost the same as natural whole milk. It is also similarly used in other dairy-type products, such as dairy creamers and frozen desserts. Coconut oil is preferable to other vegetable oils in these markets because of its taste.

Wide variety of nonfood uses. Nonfood uses of coconut oil, which account for less than half of the total imports this year, include the manufacture of quick-lathering toilet soaps, synthetic detergents, cosmetics, oil additives, hydraulic brake fluids for airplanes, fatty acids, glycerine, chemicals, and in products such as surface coatings, plasticizers, and insecticides.

Virtually all of the coconut oil used in the U.S. comes from the Philippines—the world's largest producer. Minor amounts are obtained from Indonesia, Sri Lanka, Papau-New Guinea, Malaysia, Mozambique, and a number of South Pacific islands. We bring in about one-half of all coconut oil experts, making us the number one importer of this highly useful vegetable oil.

Hefty consumption. Americans are using more and more coconut oil—ERS places consumption at 1 billion pounds for the 1975/76 season, up from 674 million pounds in 1974/75 and 808 in 1970/71. Most of the increase has been in edible products, which now amount to 59 percent of the total coconut oil consumed in this country.

With increased production of coconut oil and the costs of most major food fats down from last year's levels, coconut oil prices (crude, Pacific Coast) will probably average somewhat below last year's average price of 25 cents per pound. (In mid-June, prices were about 19 cents per pound.)

[Based on special material from Harry Doty, Commodity Economics Division.]

What Awaits Ag Grads?

Queing up to register for the fall semester, some students of agriculture will wonder whether they're standing in the wrong line.

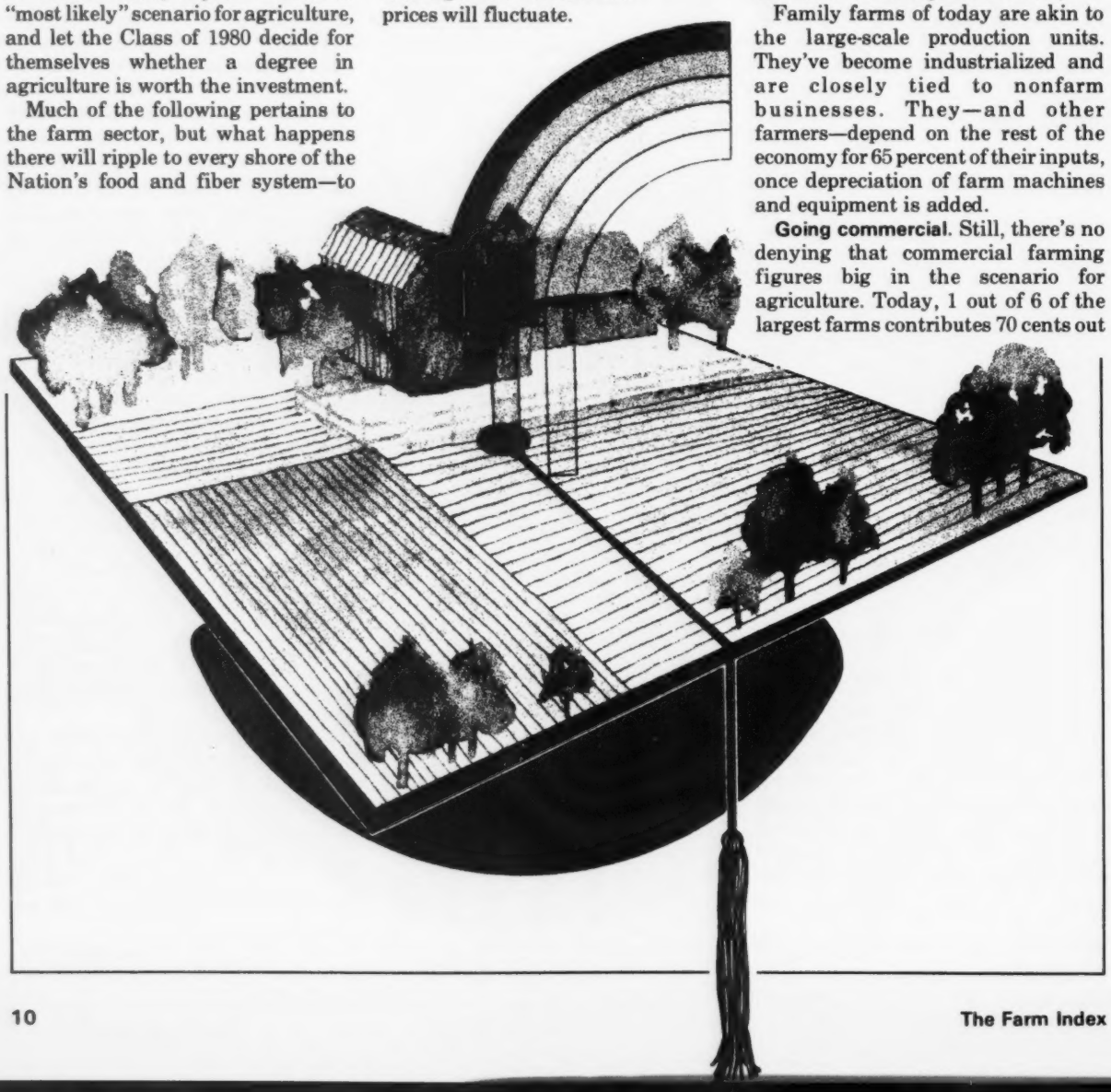
Why shell out 8 to 15 grand to be part of an industry where firm numbers are declining . . . where the little guy has slim chances of survival . . . where profits are about as unpredictable as the weather?

Economists don't claim to have the answers. At best, they can sketch the "most likely" scenario for agriculture, and let the Class of 1980 decide for themselves whether a degree in agriculture is worth the investment.

Much of the following pertains to the farm sector, but what happens there will ripple to every shore of the Nation's food and fiber system—to farm suppliers, processors, marketers, exporters and eventually to the 224 million U.S. consumers who will be bidding for the products and services of agriculture in the early 1980's.

First, some general projections:

- Demand for farm products—for domestic use as well as export—is expected to grow by 1½ to 1¾ percent annually over the next 5 to 10 years.
- Farm output will mount 1 to 3 percent a year (depending on price and weather conditions), thanks to steady advances in technology and the substitution of capital for land and labor.
- Chronic surpluses or shortages of farm products are not in the picture, although farm income and prices will fluctuate.



The farm count. No doubt, relatively few members of the Class of 1980 will go into farming. Those who do will find themselves among the elite: By 1980 we'll have only 2.2 million farm units, 600,000 fewer than 1974 and 1.8 million fewer than in 1960. In the 1960-74 period, farms with less than 50 acres accounted for over half the decline in numbers. Only farms with 500 acres or more showed increases. That's not to say the family farm is as outmoded as the home-style butter churn. Since 1949, family farms have made up 95 percent of all farms and about 60 percent of farm sales (a family farm being defined as one on which hired workers provide less than 1.5 man-years of work).

Family farms of today are akin to the large-scale production units. They've become industrialized and are closely tied to nonfarm businesses. They—and other farmers—depend on the rest of the economy for 65 percent of their inputs, once depreciation of farm machines and equipment is added.

Going commercial. Still, there's no denying that commercial farming figures big in the scenario for agriculture. Today, 1 out of 6 of the largest farms contributes 70 cents out

of every dollar in cash receipts from farming, and 60 cents of realized net farm income. Though farms with annual sales of $100,000 or more represent just 4 percent of all farms, they generate 47 percent of the cash receipts and a little over 1/3 of the net farm income.

That's only a hint of what's to come. ERS estimates that by 1980-85, farms with annual sales of $100,000-plus may increase to 8 percent of the total farm count (twice today's percentage) and may be generating nearly 60 percent of all cash receitps vs. under 50 percent right now.

Other signs of bigness. On the dairy scene, herds of 100 or more will make up 7 percent of all dairy cows by number in 1985 but 30 percent in terms of output. Farms will number 203,000 against 380,000 in recent years.

On the hog scene, farmers selling 200 or more hogs will account for over 90 percent of sales. Less than 220,000 producers will provide them, compared with 700,000 in 1973.

The average size of beef cow herds will expand rapidly in every region. Growth will stem from consolidation of farms and ranches plus the ability to use existing forages more effectively as a result of larger size.

Part-timers. For those of the Class of 1980 who'd rather not spend all their days in farming, there's always the option of part-time farming. Its importance will be increasing in the years ahead. The trends speak for themselves.

In 1930 we had fewer than 1 in 6 people engaged in farming on a part-time basis. Today 2 out of 3 farm families derive more than half their income from nonfarm sources. That proportion will be even higher by 1980 assuming people continue to move from the cities to the country, and assuming industries continue to move to rural areas where wage rates are cheaper.

As for the money it takes to get into farming, the Class of 1980 can expect some problems. The pressure on money markets won't let up, nor will high interest rates. One thing in the would-be farmer's favor, though, is that the seller provides much of the financing for buying farmland.

Raising Capital. Another alternative is the Farm Credit System. Its Federal land banks can secure funds from central money markets that will meet operators' demand for funds at a favorable level of interest. Since paper offered by the Federal land banks is considered a very high quality security, the interest rates charged to farmers are lower than for other borrowers.

Commercial banks and Production Credit Associations (PCA's)—which are also part of the Farm Credit System—provide the bulk of farmers' operating funds.

Here are some other happenings envisioned for agriculture:

More and more farmland will be leased or rented, as opposed to separate ownership. Lease or rental now accounts for over 40 percent of all land being used for farming. High land values and increased capital requirements will give further impetus to leasing and rental of land and equipment.

Corporation farming. The trend toward corporate ownership will gain momentum. But, large corporations won't be involved in any great way. Most of the new corporations will be closely held—10 or less shareholders. Right now the farms legally incorporated account for 14 percent of total farm output, and again, most fall in the closely held category. Except for legal form, nine-tenths of all corporate farms are indistinguishable from other farms controlled by proprietors and partnerships.

Incorporated or not, the family farm will remain the dominant form of American agriculture in our lifetime. It will continue to account for about 90 percent of all farms. However, the family farm of 1980 will be more modern, sophisticated, and commercially oriented.

Capital requirements for agriculture will keep escalating. Even with interest rates averaging 1.5 percent higher than for 1975, net borrowing will top $12 billion in each of the next 4 years. Total debt outstanding on January 1, 1980, may approach $175 billion, or $35 billion higher than the January 1, 1976 estimate.

Integration. There will be tighter coordination of the farm production, input, and product market sectors in the agribusiness complex. Farmers will be integrating both forward into their markets and backward into supply of inputs through their cooperatives.

For many products with unstable markets, we can expect wider use of forward contracts, futures market contracts, and private crop storage arrangements. Instability may also encourage greater diversification in crop and livestock production.

Yet, large segments of American agriculture will not become part of a highly integrated, industrialized agribusiness system. Though both cattle and hogs are moving in this direction, large-scale integration seems unlikely in the next 5 or 10 years. Production of grain and milk seems even less likely to take on the characteristics of an integrated, industrial complex.

Whither productivity? Further advances in farm output await the Class of 1980. Agricultural output is expected to grow about 1 percent a year, assuming public research and extension spending continues to increase at an annual average of 3 percent in real dollars.

Higher crop yields will contribute the biggest share of the increase. Yield increases will come mainly from more of the same technology that boosted yields in the last 25 years—hybrid seed, more fertilizer, improved machines, narrower rows and higher plant population per acre, chemical weed control, and continuous cropping of high-yielding crops.

Also, our scientists are at work on the less visible sources of productivity growth. Some of the breakthroughs are quite exotic: the enhancement of photosynthetic efficiency, greenhouse agriculture, bioregulators to aid in harvesting and storing fruits and vegetables, antitranspirants to make plants retain water, and twinning in cattle and other livestock.

[Based on "Structure and Organization of Agriculture, 1980-85," speech by Kenneth R. Farrell, Deputy Administrator, at the 1976 National Farm Marketing Conference, National Agricultural Marketing Association, Minneapolis, Minn., May 10, 1976.]

Brighter Options for Appalachia

Rural areas in general, and farm families in particular, have more than their share of poverty, statistics show. But what the numbers don't tell are some ways poor families can improve their income picture.

In a study of the potential for improving net incomes from farming in a limited resource area, economists focused on Appalachia—where poverty is more prevalent than in some other rural areas—and surveyed farms in four counties in eastern Kentucky.

Results held out some hope for these farmers, whose incomes are low for a number of reasons. For one thing, farms are small, averaging 114 acres in 1969. Also, much of the farmland consists of steep hillsides which are either wooded or badly eroded from past cultivation, providing only marginal pasture land at best. Even if existing resources on these farms were used at maximum efficiency, at prevailing prices, incomes would still be small compared with other farming areas.

In 1970, for example, more than 40 percent of the commercial farm operators in the four-county study area grossed less than $5,000 in farm sales. Over half of the family incomes were below the poverty level, and off-farm jobs were very limited.

Hard choices. Outside of public assistance, area families had three options for improving their incomes: migrate to greener pastures, seek off-farm employment, or boost income from existing farm resources.

Many, especially the younger and better educated residents, have already migrated to larger metropolitan areas in search of employment. Others, despite the area's high unemployment rates, have sought off-farm jobs. However, researchers noted that some migrants would probably like to return to the area, even at a financial sacrifice, if some minimal income were possible.

Those remaining on the farm tended to be older, less educated farmers with little or no management experience in many of the more profitable farm enterprises for the area. Their principal viable option

was to use their production resources more effectively.

Most of their farm income was derived from crops, with tobacco the most important money-earner. Other crops included hay, corn, and small acreages of cucumbers and peppers. The farms had very few livestock, mostly beef cows and some sows.

Mules vs. tractors. Two types of farms emerged from the survey of 102 farms—those that mainly used tractors for draft power (43 farms) and those that mainly used mules (59 farms). On the average, animal-power farms were smaller than the tractor-power farms (89 vs. 127 acres), and their agricultural production, measured either in quantity or value, was also smaller. Operators of animal-power farms were generally older, had higher disability rates, and fewer children for family labor.

Net income, while low for a representative farm of either type, was only $1,621 for an animal-power farm, compared with $2,662 for a tractor-power farm.

In reviewing ways to boost these incomes, researchers focused on the effects of changes in enterprise mix and improvements in the technology employed.

They used a linear programming model to come up with alternative enterprise combinations under existing and improved farming practices. But they cautioned that while the model pointed out more profitable enterprises, it assumed the same relative local prices and demand for the goods produced regardless of the number of farmers who adopted the optimum mix. If all farmers in the four counties made the same changes, they might have trouble marketing their products. Certainly, prices would not remain constant.

Unrestricted capital borrowing. If farmers could borrow any amount of capital, incomes for both types of farms would rise substantially even with no change in technology.

The tractor-power farm could increase its net income about 70 percent—from $2,662 to $4,562—by growing more profitable crops and substituting dairy cows for beef cows. With similar enterprise changes, the animal-power farm could more than double its net income—jumping from $1,621 to $3,486. In both cases, crop changes included increases in tobacco, cucumber, and pepper acreages. Boosting tobacco production would require leasing-in a sufficient tobacco allotment to fill existing curing-barn space.

Adopting improved technology as well as more profitable enterprises would increase net incomes even more—to $6,571 on the tractor-power farm and to $5,248 on the animal-power farm. In this case feeder pigs would replace dairy cows, and most of the feed corn would be purchased rather than grown. Maximum net income would be higher for the tractor-power farm largely because it had more land.

Back to reality. Despite the apparent gain from leasing-in additional tobacco allotment, very little was reported in the survey. And the optimal acreages for cucumbers and peppers also turned out to be considerably larger than what farmers had actually planted.

Many of the indicated enterprise changes, researchers noted, were more labor-intensive, and would increase hired labor requirements at different times of the year. Capital requirements for farm operations, buying animals, and building facilities would also rise dramatically if feeder pigs were added to the mix. Whether farmers would be willing to make these changes remained an unanswered question. But where capital was concerned, economists figured ability to borrow could be more of a limitation than farmers' willingness to change.

Restricted capital borrowing. To determine the effects of restricted capital borrowing, researchers limited total capital to $3,000 for the tractor-power farm and $2,000 for the animal-power farm.

With existing technology, both types of farms would again emphasize tobacco, cucumbers, and peppers, but would reduce the number of dairy cows. Since pasture requirements would be shaved accordingly, the farms would increase the amount of hay harvested and sold from pasture land.

If the tractor-power farm could borrow as much as $3,000, its net income would decline only negligibly from the unlimited borrowing situation. But if no more than $1,000 could be borrowed, dairy cows would disappear completely and net income of approximately $4,600 would be reduced by 20 percent.

Net income for the animal-power farm would be largely unaffected by limitations of either $1,000 or $2,000 on borrowed capital.

If improved technology were employed, both farms would still focus on crops and reduce the number of livestock—in this case, feeder pigs. But net incomes would be affected more severely by capital limitations, shrinking by as much as 16 percent

for the tractor-power farm and 13 percent for the animal-power farm when no more than $1,000 was borrowed. The drop would be largely due to the declining number of feeder pigs, which are far more profitable under improved technology than under existing practices.

Leasing tobacco allotments. Tobacco production is an important means to improving small-farm incomes in Appalachian Kentucky. Leasing of burley tobacco allotments by the pound has been permitted since 1971, but such leases may not exceed 5 years, and the leassor and leassee must be residents of the same county.

If these leasing restrictions were removed, some allotments *might* move from counties where labor is scarce and relatively expensive to counties such as those in Appalachia, where labor is frequently more plentiful and less costly.

Assuming modifications were made in the tobacco program, and unlimited capital borrowing were possible, net incomes would rise sharply for both types of farms, under both existing and improved technology.

At a lease price of 20 cents a pound, for example, income of approximately $4,600 for the tractor-power farm would jump by roughly 20 percent using existing technology. Tobacco would be strongly emphasized over other enterprises, and as a result, more labor would be required for harvesting.

With improved technology, tobacco would still take precedence over livestock and other crops, and net income of approximately $6,600 would rise by nearly 14 percent.

Enterprise combinations on the animal-power farm would look much the same as on its tractor-power counterpart. Using existing technology, income would increase by about 39 percent (from $3,486 to $4,839) and under improved technology by 21 percent (from $5,248 to $6,356).

Adverse possibilities. However, modifying the tobacco allotment program could have undesirable effects on small farms as well. If the within-county leasing restriction were lifted, for example, allotments could tend to move to large-scale farms in other tobacco-growing areas, rather than to the small-scale farms in Appalachian counties. This might be particularly true if tobacco harvesting becomes further mechanized.

Under these circumstances, if Applachian farmers leased out their tobacco allotments to other growers—eliminating their own production—incomes would plunge downward for both animal and tractor-power farms.

Assuming no share leasing and limited capital borrowing, net income for the tractor-power farm would be $3,544 under existing technology and $5,123 under improved technology. For the animal-power farm, net incomes would be $2,645 and $3,950 using existing and improved practices, respectively.

These results emphasize the importance of tobacco to low-income farms in eastern Kentucky. Without tobacco, farmers would increase the number of livestock and boost cucumber and pepper acreages. But while these crops can substitute for tobacco to some extent, they are substantially less profitable. Moreover, they are riskier ventures in that their production technologies are not as widely nor as well known, their markets aren't as well established, and their prices are subject to wider fluctuations.

Glimmer of hope. Overall, however, the study provided a ray of hope for small farmers in Appalachian Kentucky, showing that they can increase their incomes even with no technological improvements. Of course, by some standards, even the largest of these potential incomes would still be low. The median family income in Kentucky was $7,439 back in 1969. But since they represented substantial gains over the current financial picture, researchers wondered why farmers apparently were not making changes that would be advantageous.

Some additional survey results partially answered this question. Each farm operator had been asked what enterprises he would be interested in pursuing if he were to expand his operation, and the responses were not always the most profitable ones. For instance, beef cows scored a higher preference than either feeder pigs, dairy cows, or leasing additional tobacco allotments, even though beef cows appeared in none of the researchers' proposed solutions.

Operators had not been told the relative profitability of various enterprises, and they may not have known. It was also possible, researchers figured, that many operators could have an aversion to certain enterprises. In either case, some educational effort would probably be required to inform farmers and aid them in adopting different techniques if they wanted to do so.

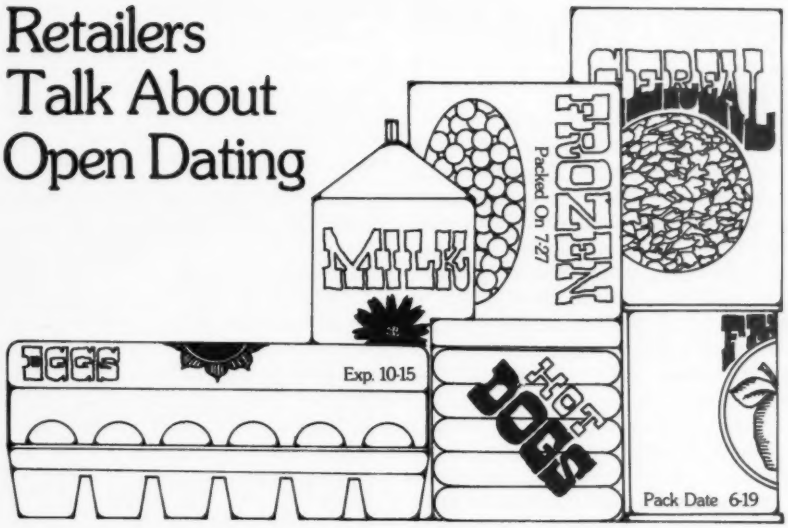
Educational considerations. But researchers cautioned that if such a program was to be effective, several findings should be kept in mind:

- The average educational level of the operators interviewed was only 6½ years, and some could have difficulty reading or handling mathematical calculations.
- Many of the farmers weren't in contact with established educational organizations, such as county extension agents.
- With the exception of tobacco, the level of technology employed in many enterprises was low.
- Some changes in enterprises and technology cannot be fully exploited without additional capital. Consequently, if educational efforts are to be successful, they may have to be accompanied by programs providing more borrowing power.

It is important to remember, however, that the Kentucky study concentrated on finding ways to make farming more profitable, and not on outside jobs, which might be combined with some farm operations. For those who could find them—and if they were available—off-farm jobs might yield more income than tobacco, dairying, or other farm enterprises with high labor requirements. This question was not studied.

[Based on the manuscript, "Potential for Increasing Net Incomes on Limited-Resource Farms in a 4-County Area in Eastern Kentucky," by Fred J. Stewart, Natural Resource Economics Division, and Harry H. Hall and Eldon D. Smith, University of Kentucky.]

Retailers Talk About Open Dating



Open dating is an open issue. How you look at it depends on whether you're a consumer, food processor, or a retailer. In March, The Farm Index *examined the issue from the processor's angle; this month from the retailer's.*

Mention "open dating" to a food retailer, and you're pretty sure to get a response. At least, ERS did when it sent out a mail survey on the subject.

Of the 362 retailers who responded, 69 percent carried some open dated products on their shelves. But even those who didn't had something to say on the subject.

Open dating varieties. Open dating, of course, refers to a date on a food package which indicates when the product should be sold or used to assure quality or freshness. The dates come in four varieties: pack (date when the product was packaged), pull (last recommended day for retail sale), quality assurance (date after which the product is not likely to be at peak quality), and expiration (usually the last day the product should be used for assured quality, although for a few products—eggs in particular—this has the same meaning as the pull date).

The survey found that the majority of retailers carried either one or two types of open dates. The pull date was No. 1, with the pack date second. The least carried type was the quality assurance date.

Pull dates made a good showing in all food categories, but the other dates tended to crop up on certain products. The pack date, for instance, was usually stamped on meat—fresh, frozen, and canned—and fresh fruits. Expiration dates appeared on some refrigerated products, particularly yeast and eggs, and on some prepackaged meats, dairy products, baked goods, and preserves. Quality assurance dates, when found, were generally on cereals, dry milk, mixes, or yeast.

"Mystery" numbers. Often, though, the dating consisted of numerals only, without an explanation of what they mean to the consumer—such as "sell by," "packed on," "use by," or "EXP." The date itself was usually found on the label, the top of the package, or the gable (as on a milk carton).

Refrigerated foods headed the list of open dated products on the grocery store shelves. Almost 8 out of 10 of the retailers carrying the dated products reported some in the dairy, meat, or other refrigerated (except fresh produce) categories.

Half the firms carried open dated baked products, and about the same number, open dated canned goods. Fresh produce came in last, with only a third of the retailers stocking any with open dates.

Firm size figures. A look at the retailers themselves showed that the larger the firm, the more likely it was to offer open dated products. For example, of the large firms, 91 percent stocked such items; of the medium-size firms, 72 percent; and of the small firms, only 61 percent.

And the retailers' views toward open dating tended to change with the size of business. Most large firms praised open dating as an instore aid for quality control, stock rotation, and employee training. Smaller firms, on the other hand, often cited technical or cost problems.

Also, there was some correlation between type of brands stocked and retailers' attitudes. For example, retailers who open dated store brands were more inclined to praise the system than retailers who offered only open dated national brands.

Trouble spots. Problems with the system most often cropped up with perishable items such as dairy products, meat, and other refrigerated goods. Reasons, according to some retailers, are: selective buying, resulting in costly wastes which must be passed on to the consumer, and technical difficulties needing further study—such as storage temperature requirements.

Firms not carrying open dated products had opinions, too. Almost three-quarters of the small retailers and 40 percent of the medium-size ones had negative viewpoints or thought that open dating was not necessary. However, some of the retailers had definite plans to phase in an open dating program in the near future.

Customer response weak. How do the retailers offering open dated products perceive their customers' reactions to the service? Of the 60 percent who replied to this question, a little over half said they had received little or no response from their customers. Over a fourth, however, reported "generally good response." The rest reported limited or negative response.

[Based on "Food Retailers and Open Date Labeling," by Eileen Taylor, Charlene Price, and Christine Hager, National Economic Analysis Division, article in *National Food Situation,* NFS 156, May 1976.]

Summer Is Prime Time for Farm Accidents

Summer's here and farm residents are doing the things they've been dreaming about all winter—fishing, swimming, picnicking, camping. The warm summer sun means lots of good things, but the season is a prime time for farm accidents, and residents and farmworkers should be aware of them.

For instance, three-fourths of all drowning deaths happen during May-August. As for machinery-related fatalities, most occur from May through October when cultivating and harvesting activities are at their peak. Many deaths due to falls also coincide with summer and fall harvesting.

Two types of fatalities. Because farms provide the physical environment for recreation and rural living, in addition to the work environment for the occupation of agriculture, accidental farm deaths are directly related to farming operations as well as recreational activities.

In 1973 (latest available data) 1,769 farm residents died as a result of both occupational and nonoccupational farm activities, excluding home and highway accidents, down from 2,407 in 1960. While 26 percent fewer farm fatalities occurred in 1973 than in 1960, the rate per 100,000 farm residents and workers increased slightly from 14.2 to 16.2.

Number one killer. Machinery claimed the most lives in 1973—about 43 percent of all farm fatalities. Tractor overturns caused about one-fourth of the deaths. However, some State safety studies indicate that tractor fatalities have declined sharply from the high rates of the early 1960's, due in part to an increased use of rollover protection equipment.

The number of machinery-related fatalities remained about the same over the study period in agricultural regions characterized by high levels of mechanization. There was a slight increase in the Appalachian, Delta, Southeast, and Mountain States, possibly because of such localized factors as hilly terrain or the use of specialized or older equipment having fewer safety features.

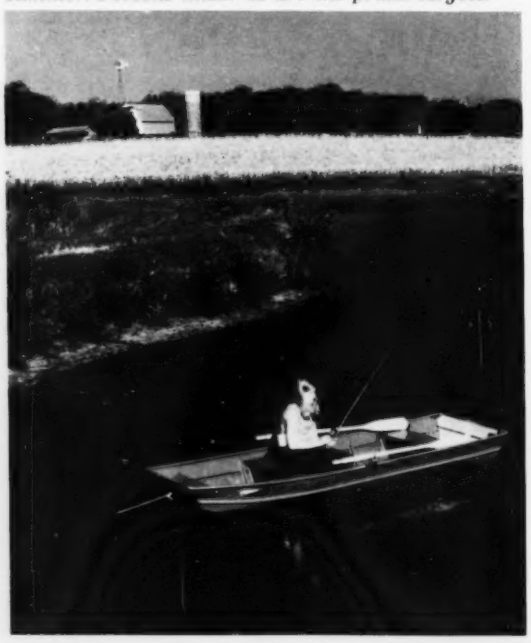
More accident prone. In all regions, deaths caused by machinery were more common among persons 45 or older. In fact, more than half of all accidental farm fatalities in this age group were the result of machinery. This compares to 30 percent or less among persons 14-24, and 40 percent for those 25-44.

Drowning accidents, the second largest cause of farm deaths in 1973, were generally greatest in regions where climatic conditions permit a longer period of water recreational activity. There was an especially high incidence among persons under 25.

The next major cause of farm deaths in the study year was firearms. Such deaths declined from the rates of the early 1960's or remained about the same in all regions except the Corn Belt, reflecting improved overall safety practices and/or less hunting on farmlands.

Tractor overturns cause a fourth of all farm fatalities each year. Safety equipment helps narrow the odds.

Three-fourths of all drownings on farms occur in the summer. Persons under 25 are the prime targets.



Deaths from machinery are more common among persons 45 or older.

Additional causes. Other causes of farm deaths in 1973 were falls, blows, electricity, burns, and poison, in that order. The number of fatalities caused by falls and blows increases with age, pointing to less agility, losses in hearing and sight, and a reduced ability to recover from injuries.

Deaths by electricity occur most frequently in regions with widespread use of irrigation, such as the Southern Plains, Mountain, and Pacific States. Persons in the 20-44 age group are the primary victims.

There were less burn-inflicted deaths in 1973 than in the early 1960's. However, this doesn't necessarily mean that there were fewer accidents caused by burns. Rather, it may indicate the application of improved medical practices in the treatment of burn patients.

Poisoning fatalities. The number of poisoning fatalities remained fairly constant over the study period and there were no regional differences. Such accidents mainly befell those between the ages of 15-44. Poisonings were responsible for only 2 percent of the total farm deaths in 1973, and nearly all were caused by gases and vapors. Only two deaths were attributed to agricultural poisons.

[Based on the manuscript "Occupational and Nonoccupational Fatalities on U.S. Farms, 1960-73," by Conrad F. Fritsch, Economic Development Division.]

Barley Booms In Frothy Form

Americans' ever mounting thirst for a frothy brew has expanded a major market for a somewhat minor grain.

In the past decade, barley used for malt liquors and other alcoholic beverages jumped 35 percent, reaching 124 million bushels in 1974/75. The vast bulk is channeled into beer and related malt beverages. Only 2 million bushels were used to produce alcohol and distilled spirits in 1974/75, and the total has dropped steadily from the 6-7 million bushels used in earlier years.

Demand from the brewing industry, however, is thriving, in line with consumers' growing demand for beer. In 1973/74, malt beverages accounted for nearly 40 percent of the barley marketed. And despite the recession, in 1974/75 barley used for brewers' malt was up 2 million bushels from the previous year, and 9 million bushels above 1972/73. Over the past 12 years, barley used for malting has increased an average of 4 million bushels per year.

Several developments contributed to this growth, and they are likely to boost consumer demand for malt liquors even higher in the next few years:

- Continued recovery and growth in the Nation's economy.
- Lower age requirements for consumption of alcoholic beverages.
- Competitive pricing of beer relative to soft drinks in some areas.
- Increasing attendance at major sports events where malt liquors are served.

But barley's story isn't entirely rosy. While it has made consistent gains in malt houses, its use has slid in another major market—animal feeds.

In 1973/74, about a fifth of the volume marketed was channeled to the prepared animal feeds industry, including whole grain and byproducts from malt liquor and distilled spirits production.

Feed use of barley has fluctuated widely over the past 2 decades, and

since 1971, it's plunged 40 percent, largely due to a drop in supplies. To some extent also, the steady rise in malt use and strong export demand in recent years have made barley less attractive as feed because of its high price relative to other feed grains.

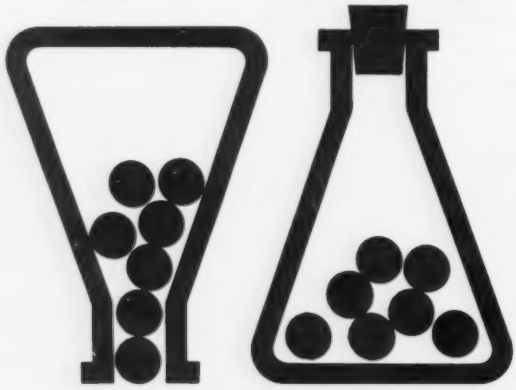
Outside the U.S., however, barley is the major feed grain both in production and use, and it's especially important in Europe and the Soviet Union. Although U.S. export volumes vary considerably from year to year—depending on world supplies of food and feed grains—over the past 5 years, they averaged 15 percent of barley's annual disappearance. Since 1972, tight supplies and strong world demand have kept barley exports at fairly high levels. In 1973/74, foreign sales accounted for 28 percent of the barley marketed by farmers.

Within the U.S., barley production is a minor share of total grain output, but it is an important enterprise in a few States: North and South Dakota, Montana, California, Idaho, Minnesota, Washington, and Colorado. These States produce about four-fifths of the Nation's barley output.

However, in the last few years, barley acreage has lost out to wheat in several production areas as grain prices soared and planting restrictions were relaxed. With recent price relationships favoring wheat and other crops, economists expect the amount of barley grown and marketed under contract with malting firms to increase in the future.

[Based on the manuscript, "Barley Consumption and Marketing Structure Changes," by Walter Heid, Commodity Economics Division.]

Organic Farming—



Pro and Con

One of the latest controversies in agriculture is organic farming—that almost forgotten practice of shunning chemical fertilizers and pesticides in favor of manure and the rotation of nitrogen-rich crops.

Before World War II the use of inorganic fertilizers was almost unheard of in some parts of the country. Nowadays the practice is widespread. About 19 million tons of fertilizer nutrients made from chemicals are applied each year, nearly 5 times more than in 1950.

Fertilizers have enabled U.S. farmers to become the world's most productive. Corn yields, for example, have more than doubled since 1950, thanks to wider use of hybrid varieties and chemical fertilizers and pesticides. The economic benefits have been substantial to the farmer and consumer alike.

Another look. Much good has come from inorganic fertilizers. Two fairly recent developments, however, have focused renewed attention on their use: the worsening energy situation; and concerns by some about the effects of chemicals on the environment, specifically, the possibility of pollution of ground water and streams by nitrogen fertilizer draining from farmlands.

The manufacture of modern fertilizers and pesticides requires both petroleum and natural gas. Shortages of these fuels since 1973 have affected the cost as well as the availability of chemicals. For instance, in Illinois the price of 100 pounds of anhydrous ammonia fertilizer jumped from an average of $4.30 in April 1973 to $14.25 in April 1975. This spring it ran about $9.50.

Fertilizers and pesticides, by the way, account for a large share of crop production expenses. An ERS study found that charges for fertilizers—both organic and inorganic—plus lime and pesticides made up 20 to 44 percent of the direct costs of producing six major crops in 1974: corn, 44 percent; cotton, 27; grain sorghum, 25; barley, 24; soybeans, 22; and all wheat, 20.

Two-sided story. Organic farming—Does it hold promise as an alternative to conventional farming methods? All the evidence is not in, but there's something to be said for both sides of the issue.

One preliminary study released last year by a private research group suggested that certain types of farms using organic methods can earn about as much money and produce about as much per acre as those relying heavily on chemicals. In addition, the selected organic farms used only a third as much energy per acre as the conventional farms, the study indicated.

ERS is represented on the advisory committee of this project. The ERS adviser emphasized that the study was of a small group of farms in the Corn Belt, only one of the many kinds of farming in the country. "The crop year (1974) was not typical," he said. "It was beset with a wet spring, late frosts, and early killing freezes in the fall. These conditions sharply restricted crop yields on both organic and conventional farms. Results would probably be different in more normal growing seasons."

The ERS representative also made this observation: "Farmers tend to use the most economic methods available to them. For example, they often save money by adding chemical fertilizer to crop residues and animal wastes, and thus inorganic fertilizer use continues to rise even on livestock farms. Similarly, use of pesticides—particularly herbicides—has increased because it has proven to be more economical than hiring labor to operate tractors or to do the hoeing and weeding. Furthermore, chemical control is usually more effective.

"Too, no measure has been made of the extent to which the organic farmers have benefited from the pest control activities of conventional farmers in their immediate area."

No-till farming. Institutions concerned with energy conservation have researched not only organic methods of farming, but other practices, such as no-till farming. Under this method, the land remains unplowed. (The plow is the heaviest energy-using tool at the farmer's disposal.) No-till farming relies heavily on modern herbicides. Even so, studies by ERS and others point out that where it is a suitable practice, no-till saves more energy than conventional farming methods. It takes less fossil fuel to make and apply the herbicides than it would to prepare a seedbed and to provide for the extra cultivations needed to control weeds if the herbicides weren't used.

USDA and the State agricultural experiment stations of the land-grant colleges have been researching the effects of organic material, crop rotations, and commercial fertilizers

on crop yields, quality, and total agricultural output for many decades. Important considerations have been the effects of various farming methods on soil and water conservation, as well as other environmental aspects. Studies are continuing to include consideration of modern practices.

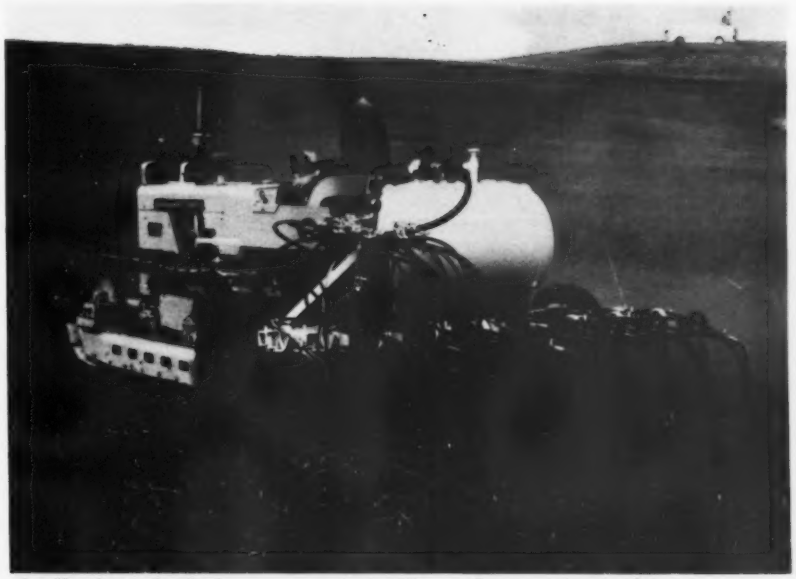
Trial at Nebraska. Most recently, the Nebraska Experiment Station launched a long-term study in the spring of 1975 to compare the effects of organic and conventional farming methods on crop yields, soil, and the environment. Observations are being made from three types of plots: (1) strictly organic, (2) corn grown on a continuous basis with chemical fertilizers added, and (3) corn rotated with clover, oats, and soybeans with chemicals.

The oldest soil research center in the U.S. is the Morrow Plots at the University of Illinois. Originally established in 1876 to determine the effect of different cropping systems on corn yield and soil properties, the plots were designated a National Historic Landmark in 1960.

Experiments from 1955 to 1975 have shown that for those conditions representative of much of the Corn Belt, the highest yields can be expected from corn grown on a rotation basis in combination with fertilizers. Corn grown on a continuous basis, even when chemical fertilizers are added, is not as productive.

The highest corn yield ever recorded on the Morrow Plots was 191 bushels per acre, produced in 1975 on a highly fertilized plot in a corn-soybean rotation. The same year, a continuous-corn plot with equal amounts of fertilization yielded only 161 bushels per acre. This was still considerably above the average farmers' yields in Illinois which averaged 116 bushels per acre last year.

Terminology. "Conventional farming" doesn't necessarily mean that the operator shuns organic nutrients. USDA and the State agricultural experiment stations have consistently encouraged the maximum use of organic materials in soil management systems. American farmers have adopted many of these suggestions.



Applications of anhydrous ammonia fertilizer reduce rot in cereal crops.

In fact, many commercial farmers are currently the prime users of organic materials as well as commercial fertilizers. It has been estimated that the tonnage of crop residues and manure being applied to commercial farms is many times the tonnage of all the sewage sludge in U.S. cities.

However, research by USDA and others indicates that the feasibility of pure organic farming without any inorganic fertilizer and chemical-based pesticides depends on the kind of farm in question, the crops produced, and the type of soil. It is not economical for large parts of the country.

Wheat output would plummet. For example, a study in the Great Plains

In this experiment it's easy to pick out the unfertilized row of corn.

Manure is used by both organic and conventional farmers. However, additional fertilizers are usually needed to maintain current rates of productivity.

found that without the application of nitrogen fertilizer, our production of hard red wheat could drop by as much as 50 percent. U.S. farm exports would suffer, not to mention the diets of millions of people in less developed nations that depend on our wheat.

Grown in the Great Plains—a region of sparse rainfall and low livestock concentrations—hard red wheat would not take well to organic farming. First of all, any rotation of nitrogen-fixing legumes would exhaust soil moisture to the point that the following wheat crop would likely fail. And the nonintensive livestock operations would rule out the spreading of much manure.

Similarly, the production of white wheat in the Palouse and Pacific Northwest regions could not be kept at current levels without nitrogen fertilizers.

Fertilizers vs. legumes. Research by agricultural experiment stations in the Midwest has shown that corn yields per acre in the Corn Belt remain basically the same when nitrogen is added to the soil by either fertilizers or legumes. For example, studies in Iowa found that over the past 10 years corn yields have averaged about 120 bushels per acre, either for corn grown in alternate years in a good legume meadow or for corn grown continuously on the same field and supplied with about 150 pounds of nitrogen per acre each year.

However, if every farmer in Iowa stopped using nitrogen fertilizers and started rotating legume crops, total corn production would probably drop 1/3 to 1/2 below current levels, because that percentage of land would have to be used for the production of legume crops instead of corn.

Soybeans lacking. The soybean, a legume, has become a highly important crop in itself in recent years. Its production would be less affected by a reduction in the use of chemical fertilizers than corn, but it would still need some phosphorus and potassium fertilizers and trace elements. As legumes, soybeans fix most of the nitrogen they need from the air, but rarely produce enough extra to meet the needs of the following crop.

Dairy farms in the Northeast and Lake States generally produce enough manure to meet about half the nitrogen requirements of the corn grown on these farms. Many dairy farms have the advantage of being located near cities, and could use sewage sludge as an added source of nitrogen.

Sludge study. A continuing study by the Agricultural Research Service and ERS, in cooperation with the Environmental Protection Agency, is aimed at developing efficient and economical composting techniques for safe utilization and/or disposal of the growing mountains of sewage sludge. The increased use of municipal sludge, composted or in other forms, could help reduce farmers' dependence upon petroleum-based fertilizers.

Though dairy farms would seem to lend themselves well to organic methods of farming, some scientists feel that even with full utilization of manure and sewage sludge, application of chemical fertilizers would be necessary to keep production on dairy farms at current levels.

According to ERS specialists, the nutrient levels in sludge do not generally coincide with the nutrient

Crop rotation is an effective way of adding nutrients to the soil. Some of the highest yields have come from fertilized crops grown on a rotation basis.

demands of the crops. Also, the extremely low level of nutrients in sludge raises questions as to how far it can be transported before it becomes uneconomical to use. Heavy metals in some sludges raise additional questions to which there must be satisfactory answers.

Citrus' preference. Florida citrus growers are perhaps the most dependent on inorganic fertilizers. The soils on which these crops are grown would produce very little in their natural state. It was only through application of commercial fertilizers, as well as developing irrigation systems, that citrus production was made possible.

These farmers use the organic matter they have on hand—leaf fall and low-growing cover crops—but the application of some chemical fertilizers is still needed to keep the soils from reverting back to their original state.

Agricultural scientists are convinced that inorganic fertilizers are essential to continue necessary production levels and to prevent slumps in farmers' incomes. They are not limiting their options, though. For example, they are studying a number of additional ways to obtain the needed plant nutrients or to use them more efficiently.

Research priorities. The current list of agricultural research priorities includes a number of projects that might lead to increased use of organic materials. Scientists are working on:

- Increasing the biological fixation of atmospheric nitrogen.
- Developing better methods of measuring the nitrogen levels of soils at planting time.
- Improving the efficiency with which our crops capture the sun's energy and convert it to human food energy.
- Improving grass legume mixtures to increase the production of milk and meat from land not suitable for grain production.

[Based on a written response to questions from the U.S. House of Representatives, Committee on Science and Technology, by Robert W. Long, Assistant Secretary for Conservation, Research, and Education, USDA; and special material by Earle E. Gavett, National Economic Analysis Division.]

Addresses of State experiment stations:

This ready reference list for readers wishing to order publications and source material published through State experiment stations will be updated again in December 1976.

STATE	CITY	ZIP CODE
ALABAMA	Auburn	36830
ALASKA	University of Alaska	99701
ARIZONA	Tuscon	85721
ARKANSAS	Fayetteville	72701
CALIFORNIA	Berkeley	94720
	Davis	95617
	Parlier	93648
	Riverside	92502
COLORADO	Fort Collins	80523
CONNECTICUT	New Haven	06504
	Storrs	06268
DELAWARE	Newark	19711
FLORIDA	Gainesville	32611
GEORGIA	Athens	30602
	Experiment	30212
	Tifton	31794
GUAM	Agana	96910
HAWAII	Honolulu	96822
IDAHO	Moscow	83843
ILLINOIS	Urbana	61801
INDIANA	West Lafayette	47907
IOWA	Ames	50011
KANSAS	Manhattan	66506
KENTUCKY	Lexington	40506
LOUISIANA	Baton Rouge	70803
MAINE	Orono	04473
MARYLAND	College Park	20742
MASSACHUSETTS	Amherst	01002
MICHIGAN	East Lansing	48823
MINNESOTA	St. Paul	55101
MISSISSIPPI	State College	39762
MISSOURI	Columbia	65201
MONTANA	Bozeman	59715
NEBRASKA	Lincoln	68503
NEVADA	Reno	89507
NEW HAMPSHIRE	Durham	03824
NEW JERSEY	New Brunswick	08903
NEW MEXICO	Las Cruces	88003
NEW YORK	Ithica	14853
	Geneva	14456
NORTH CAROLINA	Raleigh	27607
NORTH DAKOTA	Fargo	58102
OHIO	Columbus	43210
	Wooster	44691
OKLAHOMA	Stillwater	74074
OREGON	Corvallis	97331
PENNSYLVANIA	University Park	16802
PUERTO RICO	Rio Piedras	00928
RHODE ISLAND	Kingston	02881
SOUTH CAROLINA	Clemson	29631
SOUTH DAKOTA	Brookings	57006
TENNESSEE	Knoxville	37901
TEXAS	College Station	77843
UTAH	Logan	84322
VERMONT	Burlington	05401
VIRGINIA	Blacksburg	24061
VIRGIN ISLANDS	St. Croix	00850
WASHINGTON	Pullman	99163
WEST VIRGINIA	Morgantown	26506
WISCONSIN	Madison	53706
WYOMING	Laramie	82071

Recent Publications

Federally Inspected Livestock Slaughter by Size and Type of Plant. Allen J. Baker, Commodity Economics Division. Statis. Bul. 549.

The number and type of federally inspected livestock slaughter plants in operation in 1970, 1972, and 1973 are the focus of the study. Plants are classified not only by volume processed, but also by animals slaughtered—cattle, calves, sheep, goats, and hogs. Where sufficient data were available, cattle were divided into two groups: (1) steers and heifers, and (2) cows and bulls. Plant figures for earlier years are given in the appendix to give a longer term comparison.

Feed Manufacturing Costs and Capital Requirements. Carl J. Vosloh, Jr., National Economic Analysis Division. AER-335.

Costs are synthesized for 99 model feed plants producing 6-50 tons of feed per hour. The effect on costs of such factors as pelleting, packaging, warehousing, and utilization of plant capacities are also analyzed. The lowest costs are found in plants which neither pellet nor package feed and which operate 16 hours a day rather than just 8.

World Economic Conditions in Relation to Agricultural Trade. Foreign Demand and Competition Division. WEC-10.

Formerly titled *World Monetary Conditions in Relation to Agricultural Trade,* the name of this report has been changed to more clearly reflect the importance of general economic conditions on the demand for U.S. agricultural products. According to the report, the value of U.S. agricultural exports may decline slightly in 1976 because of good crops and supplies elsewhere in the world. However, nonagricultural U.S. exports are expected to increase as other countries recover from recession.

U.S. Foreign Agricultural Trade Statistical Report, Calendar Year 1975. Foreign Demand and Competition Division. Supplement to the monthly *Foreign Agricultural Trade of the United States.*

A statistical reference for agricultural exports and imports of the most recent 2 years, this publication gives breakdowns by major commodities and individual countries. The statistics are based on Census data and exclude marine foods and products which are highly manufactured, even of agricultural origin, such as textiles, leather, cigarettes, naval stores, forestry products, and distilled alcoholic beverages.

Single copies of the publications listed here are available free from The Farm Index, Economic Research Service, Rm. 1664–So., U.S. Department of Agriculture, Washington, D.C. 20250. However, publications indicated by (*) may be obtained only by writing to the experiment station or university. For addresses, see July and December issues of The Farm Index.

The Winter Fresh Tomato Industry—A Systems Analysis. John R. Brooker, University of Tennessee, and James L. Pearson, Commodity Economics Division. AER-330.

The effects of supply-management policies on the winter fresh tomato industry are estimated through a computer simulation model. The model, with both an interseasonal and intraseasonal phase, simulates the longrun effects of stabilizing weekly f.o.b. prices at prespecified levels. The model applies to tomatoes imported from Mexico as well as those grown in Florida.

Distribution Patterns for U.S. Rice, 1973/74. Shelby Holder, Alberta Smith, and J. C. Eiland, Commodity Economics Division. ERS-624.

Based on a mail survey of all known rice millers and repackagers, this study analyzes rice distribution patterns for marketing year 1973/74. Data breakdowns include distribution by type of outlet, region and State, rice type, and package size.

Farm Real Estate Taxes: Recent Trends and Developments. Mary L. Bailey, National Economic Analysis Division. RET-15.

According to this publication, farm real estate taxes in the U.S. reached $2.58 billion in 1974, an increase of 5.5 percent over 1973. Taxes per acre went up 14 cents. The tax hikes were in response to rising costs of financing State and local governments.

Analysis of the Fats and Oils Industry to 1980—With Implications for Palm Oil Imports. Wayne Boutwell, Harry Doty, Duane Hacklander, and Alan Walter. ERS-627.

The outlook for the domestic fats and oils industry between now and 1980 is analyzed in light of the projected world supply and demand picture. Since per capita consumption is expected to increase, imports of palm, coconut, and palm kernel oils are expected to remain strong, says the report, but below 1975/76 levels.

U.S. Grapefruit: Trends and Outlook. Ben W. Huang and Andrew A. Duymovic, Commodity Economics Division. ERS-626.

Grapefruit production is expected to increase in the years ahead as bearing acreage and yield continue to rise, says this report. Uptrends in exports and per capita consumption will likely continue, the report concludes, but the gains will be in processed grapefruit—mainly frozen concentrate and chilled juice—rather than in fresh.

The Agricultural Situation in the Soviet Union. Foreign Demand and Competition Division. FAER-118.

Although an overview of the entire Soviet food and fiber system in 1975 and outlook for 1976, this report gives special emphasis to agricultural developments of major concern to the U.S. Such developments naturally include those affecting the outlook for foreign trade of farm commodities.

Economic Trends

Item	Unit or Base Period	1967	1975 Year	1976 May	1976 March	1976 April	1976 May
Prices:							
Prices received by farmers	1967=100	—	185	183	185	189	192
Crops	1967=100	—	201	198	194	193	200
Livestock and products	1967=100	—	172	171	178	186	185
Prices paid, interest, taxes, and wage rates	1967=100	—	180	180	192	193	193
Family living items	1967=100	—	166	164	173	174	174
Production items	1967=100	—	182	183	194	197	196
Ratio[1]	1967=100	—	103	102	96	98	99
Wholesale prices, all commodities	1967=100	—	174.9	173.2	179.6	181.3	181.8
Industrial commodities	1967=100	—	171.5	170.3	178.9	180.0	180.4
Farm products	1967=100	—	186.7	184.5	187.2	192.9	192.6
Processed foods and feeds	1967=100	—	182.6	179.0	175.8	178.0	179.9
Consumer price index, all items	1967=100	—	161.2	159.3	167.5	168.2	—
Food	1967=100	—	175.4	171.8	178.7	179.2	—
Farm Food Market Basket: [2]							
Retail cost	1967=100	—	173.6	169.1	174.8	174.9	—
Farm value	1967=100	—	187.0	181.6	180.5	184.6	—
Farm-retail spread	1967=100	—	165.1	161.2	171.2	168.8	—
Farmers' share of retail cost	Percent	—	42	42	40	41	—
Farm Income: [3]							
Volume of farm marketings	1967=100	—	115	—	93	90	—
Cash receipts from farm marketings	Million dollars	42,817	90,572	—	6,097	6,100	—
Crops	Million dollars	18,434	47,327	—	2,112	2,100	—
Livestock and products	Million dollars	24,383	43,245	—	3,985	4,000	—
Realized gross income [4]	Billion dollars	49.9	99.2	—	107.9	—	—
Farm production expenses [4]	Billion dollars	38.2	75.5	—	79.5	—	—
Realized net income [4]	Billion dollars	11.7	23.7	—	28.4	—	—
Agricultural Trade:							
Agricultural exports	Million dollars	6,380	21,894	1,496	1,873	1,932	—
Agricultural imports	Million dollars	4,452	4,295	688	960	896	—
Land Values:							
Average value per acre	Dollars	[6]168	[7]354	—	—	—	[8]381
Total value of farm real estate	Billion dollars	[6]181.9	[7]370	—	—	—	[8]389
Gross National Product: [4]	Billion dollars	796.3	1,498.9	—	1,619.2	—	—
Consumption	Billion dollars	490.4	963.8	—	1,029.6	—	—
Investment	Billion dollars	120.8	182.6	—	232.2	—	—
Government expenditures	Billion dollars	180.2	331.2	—	349.2	—	—
Net exports	Billion dollars	4.9	21.3	—	8.2	—	—
Income and Spending: [5]							
Personal income, annual rate	Billion dollars	626.6	1,245.9	1,217.2	1,336.0	1,347.6	—
Total retail sales, monthly rate	Million dollars	26,151	48,702	48,173	53,304	53,288	—
Retail sales of food group, monthly rate	Million dollars	5,759	10,977	11,687	11,639	11,365	—
Employment and Wages: [5]							
Total civilian employment	Millions	74.4	[9]84.8	[9]84.5	[9]86.7	[9]87.4	[9]87.7
Agricultural	Millions	3.8	[9]3.4	[9]3.5	[9]3.2	[9]3.4	[9]3.3
Rate of unemployment	Percent	3.8	8.5	8.9	7.5	7.5	7.3
Workweek in manufacturing	Hours	40.6	39.4	39.0	40.2	39.3	40.3
Hourly earnings in manufacturing, unadjusted	Dollars	2.83	4.81	4.75	5.06	5.05	5.13
Industrial Production: [5]	1967=100	—	114	110	122	122	—
Manufacturers' Shipments and Inventories: [5]							
Total shipments, monthly rate	Million dollars	46,449	82,724	79,734	93,050	94,116	—
Total inventories, book value end of month	Million dollars	84,655	146,574	148,951	148,150	148,219	—
Total new orders, monthly rate	Million dollars	46,763	81,351	78,900	93,389	94,411	—

[1]Ratio of index of prices received by farmers to index of prices paid, interest, taxes, and farm wage rates. [2]Average annual quantities of farm food products purchased by urban wage earner and clerical worker households (including those of single workers living alone) in 1959-61—estimated monthly. [3]Annual and quarterly data are on 50-State basis. [4]Annual rates seasonally adjusted first quarter. [5]Seasonally adjusted. [6]As of March 1, 1967. [7]As of March 1, 1975. [8]As of November 1, 1975. [9]Beginning January 1972 data not strictly comparable with prior data because of adjustment to 1970 Census data.

Source: U.S. Dept. of Agriculture (Agricultural Prices, Foreign Agricultural Trade and Farm Real Estate Market Developments); U.S. Dept. of Commerce (Current Industrial Reports, Business News Reports, Monthly Retail Trade Report and Survey of Current Business); and U.S. Dept. of Labor.

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